

# The NIST Assessment of U.S. Measurement System

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# What is the U.S. Measurement System?

- The nation's measurement system (USMS) is comprised of the people and institutions, private and public, that make, use, or serve to insure the validity of measurements
- Measurements are carried out across the entire spectrum of the economic activity from business, trade, and commerce, through medicine and healthcare, to government and defense
- No single institution and no individual has responsibility for or authority over the entire system that produces those measurements

## What is the NIST Role in the USMS?

- NIST is the National Measurement Institute for the U.S. and is responsible for the nation's measurements and standards
- NIST has accepted the challenge to see whether the measurement system is meeting the nation's measurement needs
- NIST can help facilitate attainment of solutions to the documented industry measurement problems by engaging potential solution providers
- Dennis A. Swyt, Director, USMS Project  
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- <http://usms.nist.gov/>

## Why Look at the USMS?

- Technology innovation is a major source of the nation's economic well-being and military strength
- Critical needs in measurements are linked to technology innovation
- The primary function of the USMS is to deliver measurements that meet the needs of U.S. industries.
- An assessment can be based on a survey of industry measurement needs relative to technology innovation
- From this assessment an action plan can be developed

# Technological Innovation

*What are the measurement barriers to technological innovation?*

Research → Production → Market → End Use

**Discovery**

**Invention /  
Development**

**Manufacture**

**Sale**

**Function/  
Benefit**

“Innovation will be the single most important factor in determining America’s success through the 21st century”

--- U.S. Council on Competitiveness

# Examples

- Manufacturing
  - A researcher produces a microfluidic device for proteomics analysis but cannot translate the device into the production phase because of difficulties in reproducible mass production.
- R&D
  - A pharmaceutical company is having difficulty interpreting clinical trial data due to the lack of standardized testing results for a biomarker used to evaluate the efficacy of the drug.

## Survey Areas Used

Sectors	Semiconductor, Automotive, Software
Technologies	Broad (including Nanotechnology, Bio-/Medical Imaging, Disaster First-Responder) and Discrete (including Workshop Topics)
SI Units	Mass, Length, Time, Electrical Quantities, Temperature, Amount Substance, Luminous Intensity
Disciplines	Physics, chemistry, material science, electrical engineering, civil-mechanical engineering, manufacturing engineering, computer-IT, etc.

## **The Output**

**Fall 2006 NIST will publicly report on the results of this assessment of the USMS**

**The NIST USMS assessment report will include:**

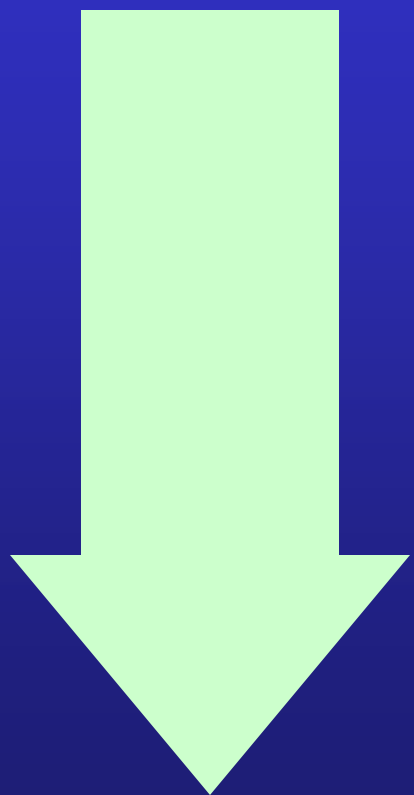
- 1. specific measurement needs that have been identified**
- 2. findings on the state of the USMS and on systemic problems**
- 3. follow-up actions to facilitate achievement of solutions**

## Intended Overall Benefits

- Allow potential providers of solutions to be engaged and mobilized
- Bring the attention of stakeholders to bear on systemic issues
- Serve as a catalyst for the identification of other industry needs and systemic problems
- Contribute to getting the nation's measurement needs addressed

# **Output from this Workshop: Part I**

## **“Big Picture” Road Map of the Technology Challenges to Enable Imaging as a Biomarker**



**Near Term: 1-3 years**

**Mid Term: 3-5 years**

**Long Term: 5+ years**

## **Output from this Workshop: Part II Detailed Measurement Need One-Pagers**

*What are the measurement science or standards barriers to the technology challenge?*

- What is the Technology at Issue?
- What is the Technology Innovation at Stake?
- What is the Economic Significance of Innovation?
- What is the Technical Barrier to the Innovation?
- What Stage of Innovation Does the Barrier Appear (R&D, Production, Marketplace, End Use)
- What is the Measurement-Problem Part of Technical Barrier
- Who are the Stakeholders?
- What are Potential Solutions to the Measurement Problem
- Who are Potential Providers of Solutions
- What is the role for Government, if Any?

# U.S. Measurement System

*Thank You for Your Participation*

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